

# MONTGOMERY COUNTY, MD

## 2019 Energy Benchmarking Report



[Montgomery County's Benchmarking Law](#) requires building owners to capture and report whole-building energy use of certain non-residential buildings 50,000 square feet and greater annually using [ENERGY STAR Portfolio Manager](#).

Published each year, benchmarking results help to:

- Provide new insights and deepen our understanding of energy consumption patterns,
- Identify energy saving opportunities within a building types and portfolios, and
- Manage business bottom lines through consistent data collection and tracking

In addition to this report highlighting 2019 results and trends, an interactive [map](#) and raw [dataset](#) are available online for further exploration.

Questions: [energy@montgomerycountymd.gov](mailto:energy@montgomerycountymd.gov)

# BENCHMARKING LAW OVERVIEW

In May 2014, Montgomery County was the first county in the country to adopt a building energy benchmarking and transparency law. The [Building Energy Benchmarking Law](#) requires property owners to capture and report high-level, whole-building energy use annually using EPA's ENERGY STAR Portfolio Manager.

Three groups are required to benchmark annually under the Benchmarking Law in Montgomery County. In July 2016, the City of Rockville opted into the Law. In March 2018, the City of Gaithersburg also opted in. DEP publicly discloses benchmarking data following the first year of reporting. This report reflects benchmarking submissions received by the County through October 1, 2020.

Group	Total Building(s) Square Footage	First Data Year	First Deadline	First Data Disclosure
County	50k sq. ft. +	2014	June 1, 2015	CY 2015 data, Oct 1, 2016
Group 1	250k sq. ft. +	2015	June 1, 2016	CY 2016 data, Oct 1, 2017
Group 2	50k sq. ft. - 250k sq. ft.	2016	June 1, 2017	CY 2017 data, Oct 1, 2018

The current Benchmarking Law covers roughly 100 million square feet of building area, representing about 35% of all commercial building area in Montgomery County.

The Benchmarking Law also requires [data verification](#) the first year of reporting and every 3 years thereafter. In 2019, many Group 2 properties were due for data verification, following their first reports in 2016.

For more information and resources on complying with the Benchmarking Law, please visit <https://www.montgomerycountymd.gov/green/energy/benchmarking.html>

2019 marks the third year of public reporting for all covered building groups, providing a robust dataset to assess energy use trends over time. This report reflects data collected through October 1, 2020.

## Compliance Rate Trending Up ([slide 6](#))

Outreach and education has been ongoing with compliance rates improving over time, particularly in the smaller, Group 2 buildings which greatly outnumber Group 1 and County buildings. **83% of covered properties submitted reports as of Oct 1, and 92% of properties eventually reported 2019 data.**

## Energy Use Intensity & Greenhouse Gas Emissions Intensity Trending Down ([slide 7](#))

Consistently reported properties saw a **2.5% reduction in weather-normalized site EUI** in 2019 compared to 2017. This amounts to a reduction of over 135 million kBtu, **equivalent to an estimated \$3.06 million** in utility cost savings.

Consistently reported properties have also collectively **reduced greenhouse gas intensity by 9% in 2019 compared to 2017**. This amounts to a reduction of 49,285 metric tons CO<sub>2</sub>e - as much as 5,600 homes' energy use for one year.

## Montgomery County Properties Beat National Averages ([slide 5](#))

Reported buildings had a **median ENERGY STAR score of 60** in 2019. Retail properties had the best energy performance with a median ENERGY STAR score of 83.

## REPORTING RATE

**83% compliance<sup>+</sup>**

County = 100%  
Group 1 = 90%  
Group 2 = 81%

## AREA REPORTED

**95.8 million**

Gross square footage reported in 2019.

## # PROPERTIES

**534<sup>+</sup>**

Properties, containing 959 buildings submitted benchmarking data or filed waivers/exemptions.

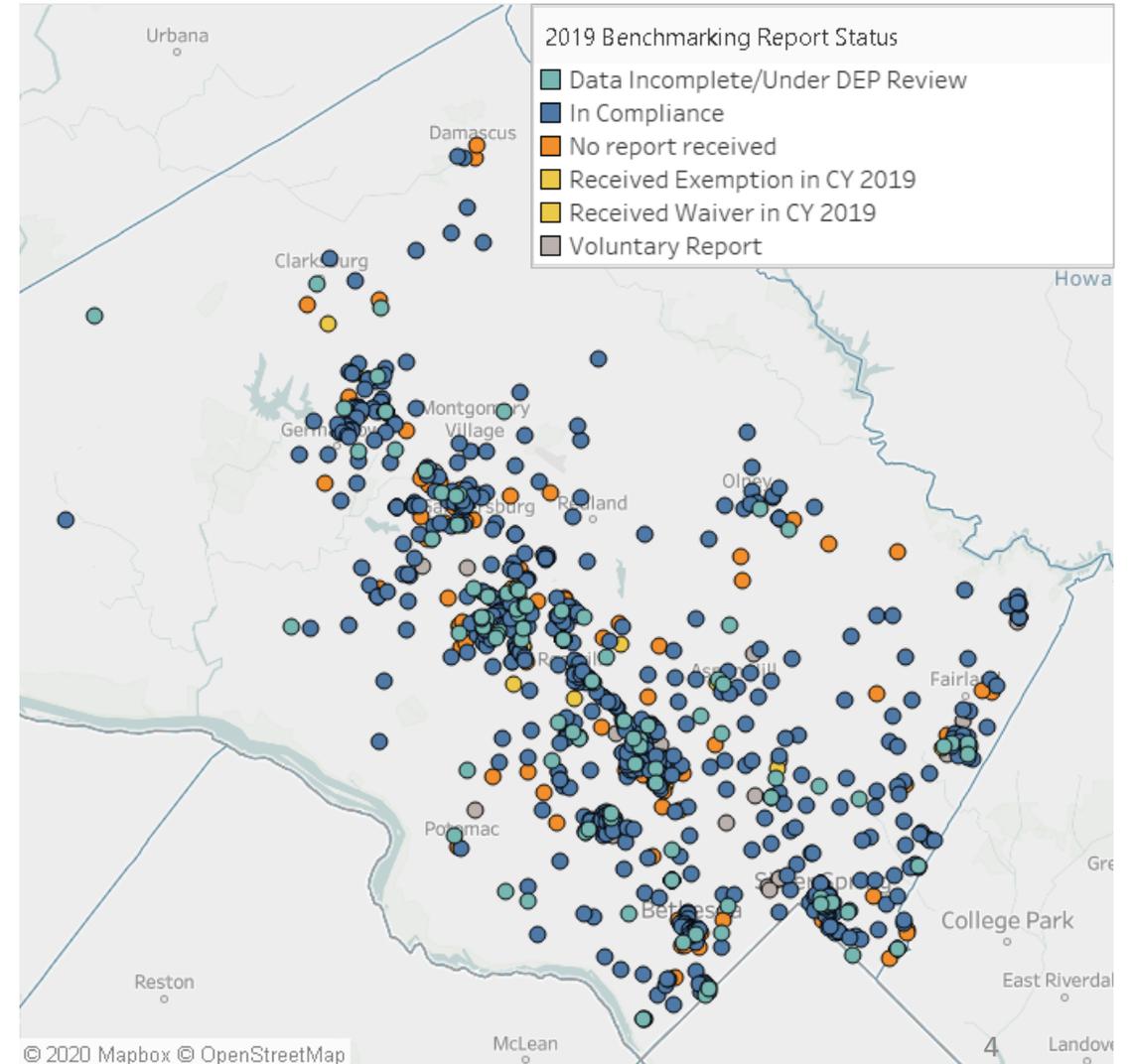
## VERIFICATION

**78.5%<sup>+</sup>**

Of required properties submitted data verification, which is due every 3 years.

<sup>+</sup> Accounts for only covered properties under the Law. All other stats and graphics include all covered and "special not-covered" reporting properties, received as of Oct 1, 2020. Since Oct 1, 92% of covered properties have reported.

## BENCHMARKED BUILDINGS



# 2019 PERFORMANCE SNAPSHOT

## ENERGY STAR

**60**

Median ENERGY STAR score for all reported properties. 50 is the national median.

## SITE EUI

**65.5**

Median weather-normalized site energy use intensity (kBtu per sq ft per year).

## GREENHOUSE GASES

**766,220 MTCO<sub>2</sub>e**

Reported in 2019: As much as 1 million acres of US forests would capture in 1 year\*, or about 7% of County-wide [GHG emissions](#).

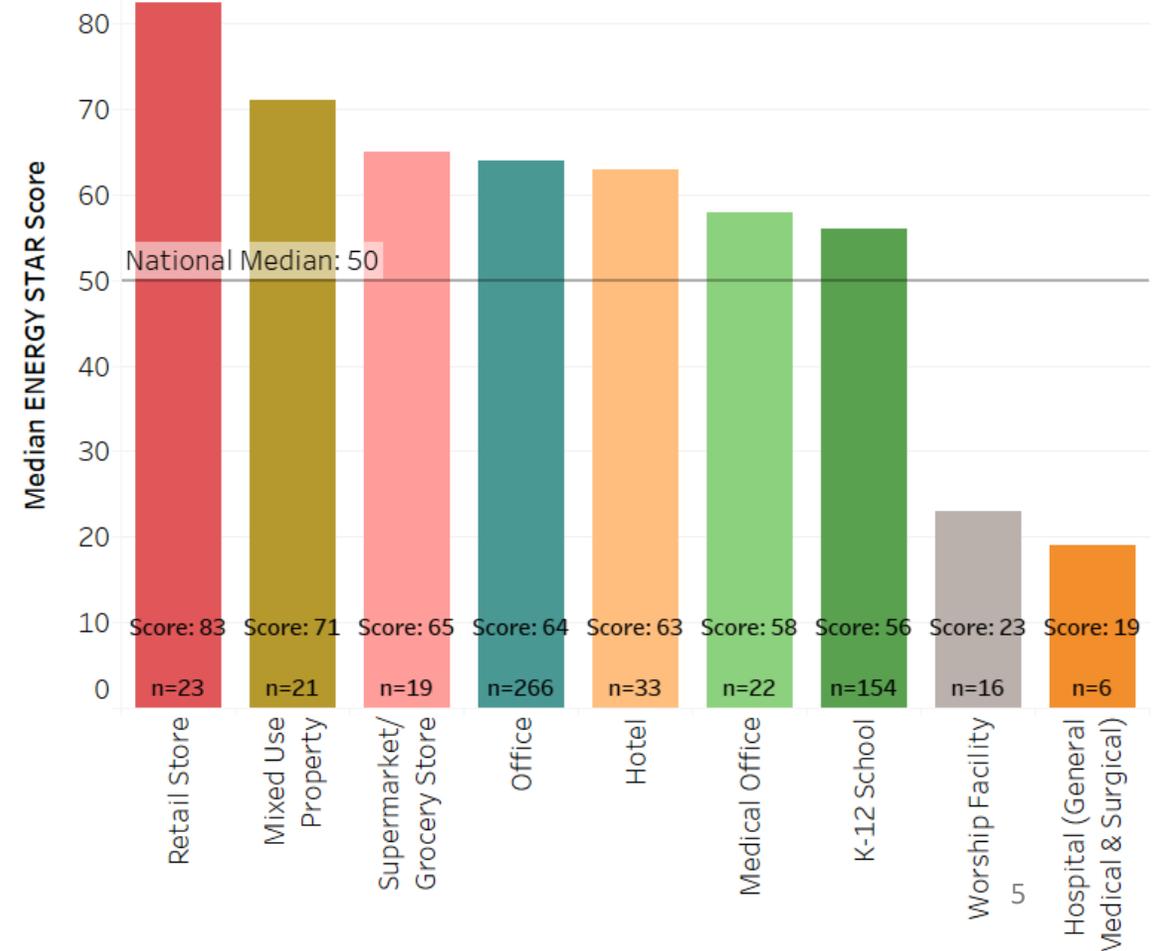
## TOTAL ENERGY

**8.8 BILLION KBTU**  
**1.7 BILLION KWH**  
**27.7 MILLION THERMS**

Reported in 2019: Accounts for >30% of all commercial energy use in Montgomery County.

## ENERGY STAR SCORE BY PROPERTY TYPE

2019 median ENERGY STAR scores for the most common property types and property count are listed on each group's column. The ENERGY STAR Score is a measure of how well a property is performing relative to similar properties, when normalized for climate and operational characteristics. A score of 50 indicates that a building is performing at the national median, taking into account its size, location, and operating parameters.



\* Accounts for only covered properties under the Law. All other stats and graphics include all covered and "special not-covered" reporting properties, received as of Oct 1, 2020.

\* EPA [GHG Equivalency Calculator](#) used for GHG equivalencies.

# TRENDS OVER TIME

## COMPLIANCE

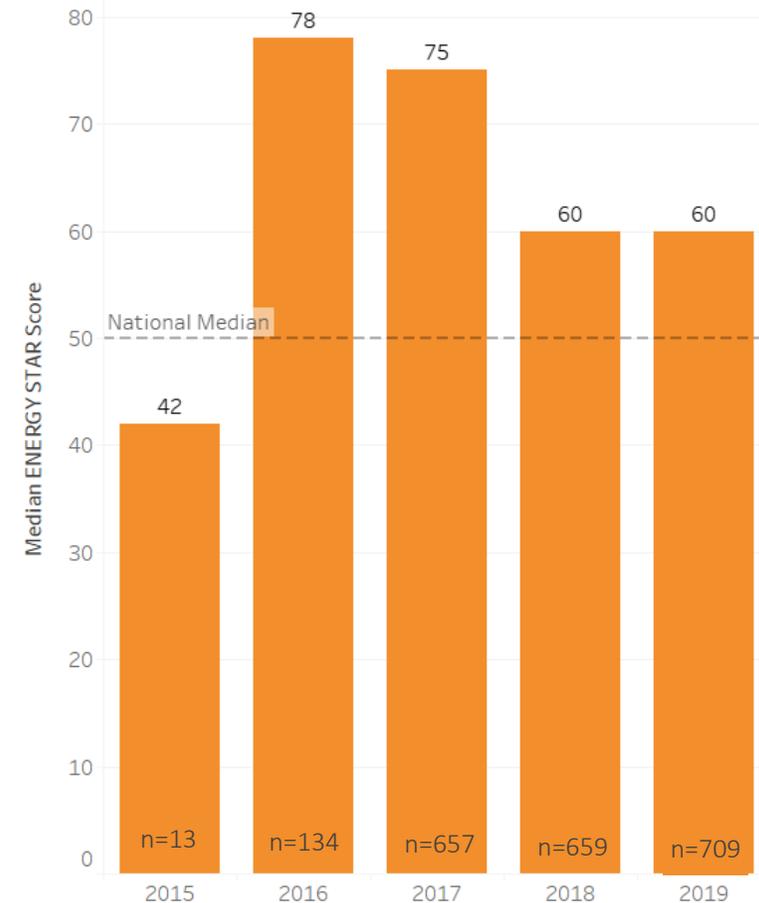
Outreach and education has been ongoing with compliance rates improving over time, particularly in the smaller, Group 2 buildings which greatly outnumber Group 1 and County buildings. 83% of covered properties submitted reports in 2019\*.

Reporting Year	Report Status	County	Group 1	Group 2	Grand Total
2015	Report Received	100%			100%
2016	Report Received	100%	87%		88%
	No report received		13%		12%
2017	Report Received	100%	68%	55%	58%
	No report received		32%	45%	42%
2018	Report Received	100%	72%	63%	65%
	No report received		28%	37%	35%
2019	Report Received	100%	90%	82%	83%
	No report received		10%	18%	17%

\* 83% had reported by Oct 1, 2020. Since then, 92% of properties have reported 2019 data including 95% of Group 1, and 91% of group 2 properties.

## ENERGY STAR SCORE

ENERGY STAR score remained consistent with 60 as the median score of all reported properties in 2019 and 2018. The large score drop between 2017 and 2018 is primarily due to EPA [recalculating score](#) methodology based on a more recent comparison dataset. This adjustment was particularly notable in offices and schools, two of the most prevalent building types, where offices dropped an average of 13 points and schools by an average of 21 points. The number of properties included is listed on each bar.



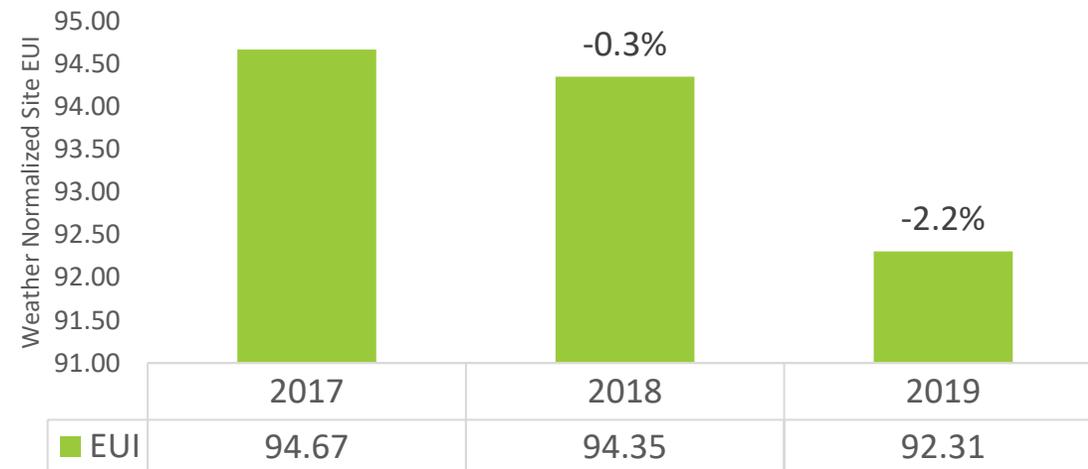
# TRENDS OVER TIME: 2017-2019

2019 marks the third year of public reporting for all covered building groups, providing a robust dataset to assess energy use trends over time. Many properties have now reported consistently between 2017 and 2019, allowing for 3 years of trends. Those properties that had consistently reported over time were included in calculations below.

## SITE ENERGY USE INTENSITY

Consistently reported properties\* have seen a **2.5% reduction in weather-normalized site EUI in 2019** compared to 2017. This amounts to a reduction of over 135 million kBtu, **equivalent to an estimated \$3.06 million in utility cost savings.\*\***

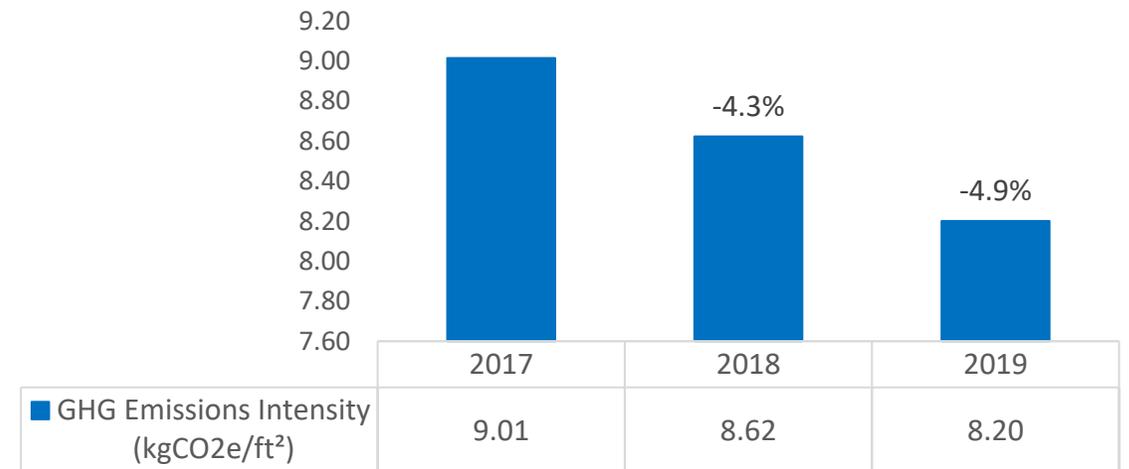
Weather Normalized Site EUI, 2017 - 2019



## GREENHOUSE GAS INTENSITY

Consistently reported properties\* have collectively **reduced greenhouse gas intensity by 9% in 2019 compared to 2017**. This amounts to a reduction of 49,285 metric tons CO<sub>2</sub>e\*\* - as much as 5,600 homes' energy use for one year.\*\* Reductions take both energy efficiency and changing grid make-up into account.

GHG Emissions Intensity (kgCO<sub>2</sub>e/ft<sup>2</sup>)



\* 450 properties had reported each year between 2017 and 2019 and had weather-normalized site EUI available as a metric; 484 properties reported each year between 2017 and 2019 and had greenhouse gas emissions available as a metric. Properties with change in sq ft, kBtu, or GHG +/- 50% were removed for potential data quality issues.

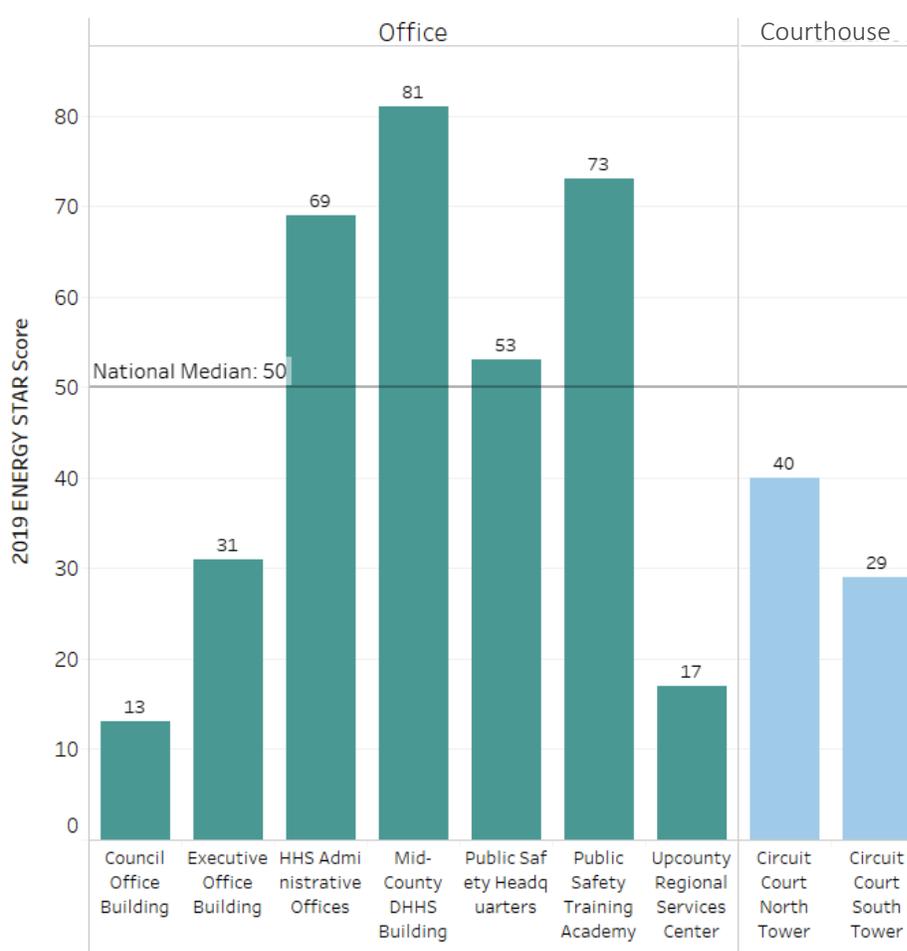
\*\* See page 11 for notes on calculations.

# 2019 COUNTY ENERGY PERFORMANCE

## COUNTY-OWNED BUILDINGS

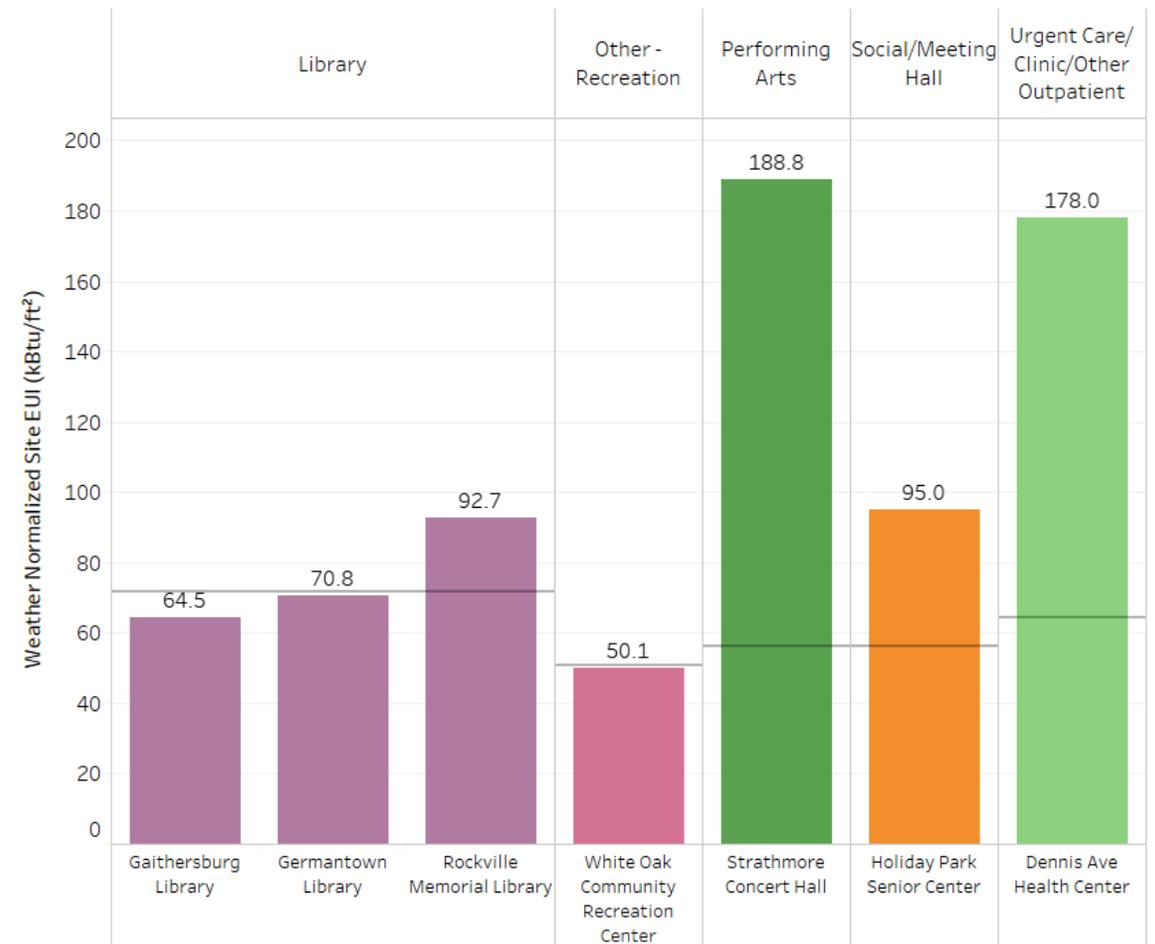
### ENERGY STAR SCORE BY PROPERTY

Courthouses and Offices can receive ENERGY STAR scores. 50 is the National Average. **Higher ENERGY SCORE = better performance.**



### WEATHER-NORMALIZED SITE EUI

Other space types cannot receive an ENERGY STAR score but can be assessed based on site energy use intensity (kBtu of energy use/ sq ft/year) compared to the national median for each property type. **Lower site EUI = better performance.**

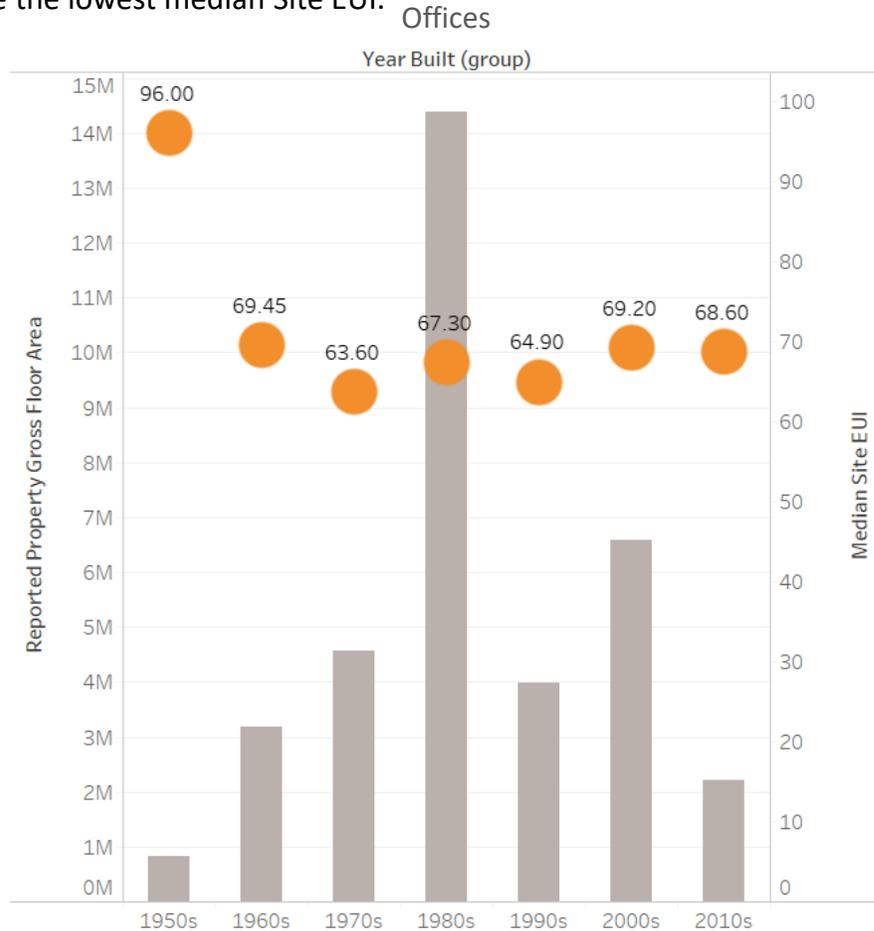


# PERFORMANCE TRENDS: OFFICES

Offices are the most-reported property type and represent about half of all square footage reported. Focusing on this group helps inform overall data trends.

## ENERGY STAR SCORE BY OFFICE BUILDING AGE

Most offices reported in Montgomery County were built in the 1980s (represented by the gray bar). Year built does not have a substantial bearing on energy performance (represented by the orange dot). Offices built in the 1970s have the lowest median Site EUI.



## ENERGY STAR SCORE BY OFFICE SIZE

Grouping by building size, however, shows that larger office buildings tend to have higher ENERGY STAR scores. This trend holds for overall properties as well. A greater number of reports from smaller buildings since 2017 have also impacted the overall County median ENERGY STAR score.



# CASE STUDY: 5601 FISHERS LANE

- **Property Name:** 5601 Fishers Lane
- **Owner:** [USAA Real Estate](#)
- **Manager:** [JBG Smith](#)
- **Type:** Office
- **Gross Floor Area:** 515,717
- **Year Built:** 2014
- **ENERGY STAR Score:** 97

As a “Group 1” covered benchmarking property, 5601 Fishers Lane has been reporting public benchmarking data since 2016. Over that time, **the property has reduced weather-normalized site energy use a whopping 30% - going from a site EUI of 84 in 2016 to 59 in 2019.**

Despite being built to LEED Platinum New Construction standards, when it first opened, 5601 Fishers Lane had issues related to sequence of operations and the ability to provide free cooling. For four years the chillers were running full time to provide cooling for the building, especially the data center onsite.

The tenant, National Institute of Allergy and Infectious Diseases (NIAID), invested in new ways to reprogram the power supply for the data center, and this reconfiguration allowed for free cooling to the data center. The chiller’s run time was reduced 50%. Additionally, the data center’s temperature setpoint was adjusted from 68 degrees to 73 degrees which also contributed to the large energy savings.

The cooling strategy now consists of water cooling, air cooling, and free cooling. The daily operations of the chiller and free cooling is manually managed which has proved useful in identifying and harnessing energy savings. The Energy Recovery Units (RCU) are optimized to reduce waste heat extraction and has contributed to the energy savings as well.

The coordinated work of the tenant Data Center management team and the onsite building engineering team has maintained a high level of performance and the building has recently achieved LEED Platinum for Existing Buildings: Operations and Maintenance.



## Definitions:

- **Covered Property** – Non-residential buildings, or any group of buildings that have the same property identification number, that are 50,000 square feet and greater. Use the [online GIS map](#) created from current Maryland tax assessment records to locate the parcel that a building sits on and see what other buildings share the parcel.
- **ENERGY STAR Score** – The ENERGY STAR Score is a measure of how well a property is performing relative to similar properties, when normalized for climate and operational characteristics. The ENERGY STAR scores are based on data from national building energy consumption surveys, and this allows Portfolio Manager to control for key variables affecting a building's energy performance, including climate, hours of operation, and building size. The 1-100 scale is set so that 1 represents the worst performing buildings and 100 represents the best performing buildings. A score of 50 indicates that a building is performing at the national median, taking into account its size, location, and operating parameters. A score of 75 indicates that a property is performing in the 75th percentile and may be eligible to earn [ENERGY STAR Certification](#).
- **Greenhouse Gas (GHG) Emissions** – The carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) gases released into the atmosphere as a result of energy consumption at the property. GHG emissions are expressed in carbon dioxide equivalent (CO<sub>2</sub>e), a universal unit of measure that combines the quantity and global warming potential of each greenhouse gas, or as an intensity value in kilograms per square foot (kgCO<sub>2</sub>e/ft<sup>2</sup>):
- **Gross Floor Area (GFA)** – Measured as the area between the outside surface of the exterior walls of the building(s). This includes all areas inside the building(s) including supporting areas. GFA is not the same as rentable space, but rather includes all area inside the building(s).
- **Site Energy Use Intensity (EUI)** – The annual amount of all the energy a property consumes on-site to meet the energy loads of a building, regardless of the source, divided by gross floor area. Site EUI represents energy consumed by a building relative to its size measured in kBtu per square foot per year.
- **“Special Not-Covered” Property** – Includes Montgomery County Public Schools and Montgomery College buildings. As state-owned buildings, these properties are not subject to Montgomery County's Benchmarking Law but have reported data each year voluntarily.
- **Weather Normalized Site Energy Use Intensity (EUI)** – The energy use a property would have consumed during 30-year average weather conditions, divided by gross floor area. For example, if 2019 was a very hot year, then *Weather Normalized Site EUI* may be lower than *Site EUI*, because you would have used less energy if it had not been so hot. It can be helpful to use this weather normalized value to understand changes in energy when accounting for changes in weather.

## Notes & Reference:

- **Voluntary Reports** – As of October 2020, DEP received 39 voluntary CY 2019 reports from buildings not covered under the current Benchmarking Law. Data from those benchmarking reports are not included in this report.
- **Calculating Utility Cost Savings Estimates** – On average, 67% of energy use in reported buildings comes from electricity. The 2019 average commercial retail price of [electricity](#) was 9.48 cents per kWh and \$12.46 per thousand cubic feet of [natural gas](#).
- **Calculating GHG Trends** – ENERGY STAR Portfolio Manager recalculates historical GHG emissions when new protocols become available, however data reported to Montgomery County is fixed in time. Read more about ENERGY STAR's [methodology for calculating GHG emissions](#). EPA [GHG Equivalency Calculator](#) used for GHG equivalencies.